

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) An apparatus for seismic measurements, comprising:

~~wherein~~ a seismic source; ~~and~~  
a plurality of streamers having hydrophone devices,  
said seismic source and said plurality of streamers  
being ~~are~~ towed behind a vessel; ~~and wherein~~

a pair of deflectors ~~are used that are~~ submerged in the sea; ~~and have a means between them designed to ensure that the spacing between the hydrophone devices transverse to the vessel's direction of travel is maintained in that, as the vessel moves, the deflectors seek to move in a direction transverse to the vessel's direction of travel, a wire being fastened between the said deflectors in order to limit the spacing between the deflectors, characterised in~~

~~that spaced apart and mounted on the said wire are hydrophone devices which in relation to the spacing of the devices have a short lengthwise extent transverse of the wire in the vessel's direction of travel, and wherein the devices are connected together by a hydrophone signal cable which extends along the said wire;~~

~~that the hydrophone devices consist of short streamers that extend parallel to the vessel's direction of travel and have a lengthwise extent that is 25-400% of the spacing between the streamers; that~~

a wire fastened between the deflectors, said wire limiting spacing between and outward movement of the deflectors transverse to a direction of travel of the vessel as the vessel moves,

said plurality of streamers mounted on said wire with a spacing therebetween in a range of 1 to 25 meters,

said wire when stretched between the deflectors causing the streamers attached thereto to maintain a set spacing,

said plurality of streamers extending parallel to the vessel's direction of travel and having a lengthwise extent that is 25% to 400% of the spacing between the streamers with a minimum lengthwise extent of 25 cm and a maximum lengthwise extent of 100 meters;

a hydrophone signal cable connecting said plurality of streamers together, said hydrophone signal cable extending along said wire,

each streamer ~~has~~ having m hydrophones,

and ~~where the~~ analog signals ~~are~~ from said m hydrophones being summed up,

analogously and form

the m hydrophone devices of each streamer forming a single-channel hydrophone device, ~~that~~

a total of n hydrophone devices are streamers being mounted on the hydrophone signal cable, thereby forming a total of n single channel hydrophone devices; and

~~that the apparatus comprises~~

an n-channel sampling device for sampling all the n single-channel hydrophone devices simultaneously.

2. (currently amended) An apparatus as disclosed in claim 1, ~~characterised in that~~ wherein,

the seismic source is located between the vessel and the hydrophone signal cable that extends along the wire.

3. (currently amended) An apparatus as disclosed in claim 1, ~~characterised in that~~ wherein, a seismic source is located on one or both of the deflectors.

4. (currently amended) An apparatus as disclosed in claim 1, ~~characterised in that~~ wherein, said lengthwise extent is 80% of said spacing between the streamers within a range of 80 cm to 20 meters.

5. (currently amended) An apparatus as disclosed in claim 1, ~~characterised in that~~ wherein, the ~~short~~ streamers have a length in the range of 1-25 metres, ~~preferably 12.5 metres.~~

6. (currently amended) An apparatus as disclosed in claim 1, ~~characterised in that~~ wherein,  $n > m$ .

7. (currently amended) An apparatus as disclosed in claim 1, ~~characterised in that~~ wherein,  $n \leq m$ .

8. (currently amended) An apparatus as disclosed in claim ~~[[6]]~~ 1, ~~characterised in~~ wherein,

~~that~~  $m$  is an integer between 6 and 24; and

~~that~~  $n$  is an integer between 12 and 96.

9. (currently amended) An apparatus as disclosed in claim 1, ~~characterised in~~ wherein,

~~that~~  $n = 24$ ; and

~~that~~  $m = 12$ .

10. (currently amended) An apparatus as disclosed in claim 1, ~~characterised in that~~ wherein, the signal cable, to which the  $n$  single channel hydrophone devices are ~~attached is~~ connected via connected, has an outlet ~~on the signal cable to the~~ connected by an additional signal cable to signal control and

processing equipment on board the vessel ~~by means of an additional signal cable that extends from the cable outlet to the vessel.~~

11. (currently amended) ~~The use of an~~ An apparatus for seismic measurements as disclosed in claim 1, configured to provide for seismic measurements in a seabed at a distance downwards that corresponds into a seabed by a distance being approximately equal to the depth of the sea from the sea surface to the seabed at the a specific measuring point thereat.

12. (currently amended) An apparatus as disclosed in claim 4, ~~characterised in that~~ wherein, the ~~short~~ streamers have a length in the range of ~~1-25 metres, preferably 12.5 metres~~ meters.

13. (currently amended) An apparatus as disclosed in claim 7, ~~characterised in~~ wherein,

the seismic source is one of i) located between the vessel and the wire that extends between the deflectors, and ii) is located on at least one of the deflectors,

~~that~~ m is an integer between 6 and 24; and

~~that~~ n is an integer between 12 and 96.

14. (currently amended) An apparatus as disclosed in claim 3, ~~characterised in~~ wherein,

the seismic source is located externally on one of the deflectors;

~~that~~  $n = 24$ ; and

~~that~~  $m = 12$ .

15. (new) An apparatus as disclosed in claim 1, wherein,

seismic sources are located externally on each of the deflectors.

16. (new) An apparatus for seismic measurements, comprising a seismic source and a plurality of streamers having hydrophone devices, said seismic source and said plurality of streamers being towable behind a vessel, a pair of deflectors submerged in the sea, and a wire being fasted between the deflectors to limit spacing between and outward movement of the deflectors transverse to a direction of travel of said vessel as the vessel moves, said wire when stretched between the deflectors causing streamers attached thereto to maintain a set spacing,

- wherein hydrophone devices are mounted on said wire with a spacing therebetween in the range of 1-25 meters,

- wherein said plurality of streamers extend parallel to the vessel's direction of travel and have a lengthwise extent

that is 80% of the spacing between the streamers with a minimum lengthwise extent of 80 cm and a maximum lengthwise extent of 20 meters,

- wherein the streamers are connected together by a hydrophone signal cable which extends along the said wire,

- wherein each streamer has  $m$  hydrophones and where analog signals from said  $m$  hydrophones are summed up, the  $m$  hydrophone devices of each streamer thereby forming a single-channel hydrophone device,

- wherein a total of  $n$  streamers are mounted on the cable, thereby forming a total of  $n$  single-channel hydrophone devices, and

- wherein the apparatus comprises an  $n$ -channel sampling device for sampling all of the  $n$  single-channel hydrophone devices simultaneously.

17. (new) An apparatus for seismic measurements, comprising a seismic source and a plurality of streamers having hydrophone devices, said seismic source and said plurality of streamers being towable behind a vessel, a pair of deflectors submerged in the sea, and a wire being fasted between the deflectors to limit the spacing between and outward movement of the deflectors transverse to a direction of travel of said vessel as the vessel moves, said wire when stretched between the

deflectors causing streamers attached thereto to maintain a set spacing in,

- wherein said plurality of streamers are mounted on said wire with a spacing therebetween in the range of 1.25-31.25 meters,

- wherein said plurality of streamers extend parallel to the vessel's direction of travel and have a lengthwise extent that is 80% of the spacing between the streamers with minimum lengthwise extent of 1 meter and a maximum lengthwise extent of 25 meters,

- wherein the streamers are connected together by a hydrophone signal cable which extends along the said wire,

- wherein each streamer has **m** hydrophones and where analog signals from said **m** hydrophones are summed up, the **m** hydrophone devices of each streamer thereby forming a single-channel hydrophone device,

- wherein a total of **n** streamers are mounted on the cable, thereby forming a total of **n** single-channel hydrophone devices, and

- wherein the apparatus comprises an **n**-channel sampling device for sampling all of the **n** single-channel hydrophone devices simultaneously.



18. (new) An apparatus for seismic measurements, comprising a seismic source and a plurality of streamers having hydrophone devices, said seismic source and said plurality of streamers being towable behind a vessel, a pair of deflectors submerged in the sea, and a wire being fasted between the deflectors to limit the spacing between and outward movement of the deflectors transverse to a direction of travel of said vessel as the vessel moves, said wire when stretched between the deflectors causing streamers attached thereto to maintain a set spacing in,

- wherein said plurality of streamers are mounted on said wire with a spacing therebetween in the range of 1-25 meters,

- wherein said plurality of streamers that extend parallel to the vessel's direction of travel and have a lengthwise extent that is in the range of 1-25 meters,

- wherein the streamers are connected together by a hydrophone signal cable which extends along the said wire,

- wherein each streamer has  $m$  hydrophones and where analog signals from said  $m$  hydrophones are summed up, the  $m$  hydrophone devices of each streamer thereby forming a single-channel hydrophone device,

- wherein a total of  $n$  streamers are mounted on the cable, thereby forming a total of  $n$  single-channel hydrophone device, and

- wherein the apparatus comprises an  $n$ -channel sampling device for sampling all of the  $n$  single-channel hydrophone devices simultaneously.

19. (new) The apparatus as disclosed in claim 16, wherein the seismic source is one of i) located between the vessel and the wire that extends between the deflectors, and ii) located on at least one of the deflectors.

20. (new) The apparatus as disclosed in claim 17, wherein the seismic source is one of i) located between the vessel and the wire that extends between the deflectors, and ii) located on at least one of the deflectors.

21. (new) The apparatus as disclosed in claim 18, wherein the seismic source is one of i) located between the vessel and the wire that extends between the deflectors, and ii) located on at least one of the deflectors.